The Effects of Light-Rail Transit on Affordable Housing in Seattle, WA

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Acknowledgements

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Introduction

Abstract

Since the creation of public transportation in the realms of the late 19th, its main purpose has been to move citizens throughout a specific area efficiently and safely. As public transit developed further into the 20th and 21st century, its goal became to provide alternatives so that fewer cars could be on the road and so that anyone car owner or not could get to their points of interest quickly and frequently. When designing and building public transit lines, many factors fail to receive the attention they deserve with regards to effects on the communities that they serve. Public transit lines have positive and negative, direct and indirect, effects on certain communities. Unfortunately, many of those potential negative indirect effects are overlooked.

This paper looks at Seattle's Sound Transit Central Link Light-Rail system, and the effect that its creation has had on housing affordability in five South Seattle neighborhoods in reference to five separate transit stops. The five neighborhoods being profiled in this study are some of the most racially and economically diverse in the city. They include the neighborhoods and stations of Beacon Hill (Beacon Hill Station), Mount Baker (Mount Baker Station), Columbia City (Columbia City Station), Dunlap (Othello Station), and Rainier Beach (Rainier Beach Station). The Link Light-Rail in Seattle opened in 2009, making it one of the newer light-rail systems in the United States. This paper uses demographic data from the most recent 2010 U.S. Census, 2000 Census, American Community Survey, and Sound Transit to identify the connections between the implementation of light-rail and housing affordability This quantitative study also integrates information from previous literature, newspaper articles, and a neighborhood

walking analysis to examine whether light-rail has an effect on housing affordability in these communities.

City Profile

The city of Seattle is one of the northernmost cities in the United States. Located in the Pacific Northwest region of the U.S., Seattle is bounded between the eastern border of the Puget Sound to the west, and Lake Washington to the east. With a population of roughly 660,000, Seattle is the largest city in the state of Washington and in the Pacific Northwest. The metropolitan area of the city is located with King, Snohomish, and Pierce County, containing 3.7 million residents, the 15th largest metropolitan area in the United States. Seattle and the Pacific Northwest is known for its Mediterranean climate, with weather that consists of mostly rain through the majority of the year, with consistent sunshine during the summer months. Seattle's location on the Pacific Rim has made it a gateway for trade and commerce internationally specifically with Asia, making it the fourth largest port in North America (Port of Seattle, 2016). Geographically the city is located on an isthmus between the Puget Sound and Lake Washington, with hilly terrain throughout the city limits. These hills paved the names for many of Seattle's neighborhoods such as First Hill, Capitol Hill, and Beacon Hill (History Link, 2016). The city of Seattle has grown astronomically over the course of the last few decades. The Seattle Times reports that Seattle has been in the top five of fastest growing cities in the United States for the last three years. Much of this growth can be contributed to companies such as Microsoft, Amazon, and Boeing attracting more employees from all around the world. Seattle has unofficially become a hub where people have flocked to gain both employment and to start a new life in a place deemed one of the most livable in the country (Dill, 2015). Growth in the city limits has contributed to the need for more

housing. The housing market in both Seattle and the Pacific Northwest has skyrocketed in recent years, sending the costs of housing and rent to some of the highest rates in the country. With the opening of the Link Light-Rail in 2009, it's possible that much of the increase in rent and housing costs in these South Seattle neighborhoods where the light-rail passes through could have been contributed to the expansion of this public transit.

Literature Review

A variety of studies have been done in cities across the country that details the effects of public transportation on neighborhoods. In a study done in the San Francisco Bay Area on capitalization of transit investments into single-family home prices, the preliminary information with data from San Francisco's BART transit system stated that for every meter a single-family home was closer to a BART station, its sales price increased by $2.29. This contrasts with San Jose, CA, where single-family homes within 300 meters of a light-rail station were worth roughly $31,000 less than properties outside its immediate impact zone. The same study also showed that in 1990, homes within 300 meters of a CalTrain Commuter Rail Station sold at a discount of $51,000 (Landis et al, 1994). Information like the one shown in this study suggests that not every transit system has the same effect on its surrounding neighborhoods as other places might. Each city might be different from other cities with similar forms of transportation. Literature on the San Francisco Bay Area showed that the connection between public transportation and the value of property is an important way to determine transits effectiveness and impact on certain communities. Chen, in his GIS study on the impact of light-rail on single-family homes in Portland indicated that light-rail in that area had both positive and negative effects: the positive effects were in relation to accessibility, and the negative effects were in relation to nuisance. Moreover, the positive effect dominates the negative, implying a

declining price gradient as someone moves away from the light-rail stations for several meters (Chen et al, 1997). The Center for Housing Policy states that in theory, a home located near public transit should commend a higher rent or sales price than one that sits farther away. This is because transit lets people living close to it travel to and from destinations that are important to them (Wardrip, 2011). Every city surveyed in this study (Atlanta, Minneapolis, Chicago, Miami, and Portland) showed an increase in housing after public transit was expanded into certain neighborhoods, costs compared to previously when no transit existed.

What only a few of these studies mention, though, are the negative effects that come with rising costs of rent and housing affordability due to the implementation of transit. A 2015 article in the Seattle Weekly newspaper stated that some residents in South Seattle fear that new transit in their neighborhoods contributes to gentrification and displacement of lower income families, rather than help lifting people out of poverty by giving them access to reliable transportation (Person, 2015). Members of these communities have brought awareness to the issue and both the City of Seattle and Sound Transit are listening. Sound Transit officials have admitted that gentrification and displacement hasn't been a big issue until recently. The mindset of Sound Transit officials when building the Central Link LRT was "just get it built", said Seattle councilman Mike O'Brien who also sits on the Sound Transit board. Now officials are taking everything into account with future LRT expansions in the works (Person, 2015). With studies done on other cities involving housing affordability and transit, and newspaper articles that mention the neighborhood being studied in this project, there is a significant amount of literature that supports the possibility of light-rail being connected to housing becoming unaffordable.

Research Context

The research context consists of photos of the study area in the various neighborhoods in South Seattle, as well as written descriptions. Most of these photos were taken in the Columbia City, Rainier Beach, and Dunlap (Othello Station) neighborhoods. These photos convey the current state of these neighborhoods, brief history, and can provide clues as to the direction the neighborhood is headed in regards of the type of housing available for residents.

Rainier Beach

The Rainier Beach neighborhood has many examples of multi-family housing and lower income housing. Apartments like this are common across the community, specifically on S. Henderson St. and located not far from the Link Light-Rail Rainier Beach Station. As there are various amounts of low throughout the neighborhood, there was evidence of more market rate housing being built. This can be seen on the left side of the second photo. Across the street (S. Henderson St.), older housing can be seen. Rainier Beach is

one of two neighborhoods in Seattle that has a predominantly African American population. Being one of the oldest communities in the city, Rainier Beach has been given the designation of one of the most diverse ZIP codes in America. An area that has established itself as an NBA sending haven with its successful boys high school basketball team (Rainier Beach High School), Rainier Beach has gone through its fair share of transitions and continues to do so today.

Othello (Dunlap Neighborhood)

The Dunlap neighborhood where the Othello station is located, located just north of Rainier Beach has more commercial development than most of other neighborhoods in South Seattle. Most of this development is located on Martin Luther King Jr. Way right along the Link Light-Rail tracks and station as seen in the top left photo. These

businesses have and continue to serve the community today. Within the neighborhood, the types of housing are changing, with newer multi-family and single-family, housing located adjacent from older multi-family housing. Similar to Rainier Beach these new developments are representative of the new population moving into these neighborhoods.

Columbia City

Columbia City has more visible signs of change than any other community in the Rainier Valley. The left photo shows the construction of higher end multi-family housing located adjacent to the Link Light-Rail tracks. Compared to the other communities in the valley, new construction of expensive trendy housing is more common in Columbia City than in any other neighborhood. Columbia City is the neighborhood in the Rainier Valley that is considered a historic district. It has gained popularity in recent years for its array of shops, bars, and restaurants. WalkScore.Com gave Columbia City a walk score of 98 due its proximity to public transit, pedestrian friendly infrastructure, and implementation of transit-oriented development. Columbia City has a wide variety of mixed-incomes

throughout the community, making it one of the most income diverse neighborhoods in Seattle. As a historic district Columbia City started as a town site by a developer that built a rail line from downtown Seattle through the Rainier Valley (History Link, 2016). Columbia City would eventually become incorporated and annexed into Seattle city limits in the early 1900s, and benefit from rapid growth in the Post World War II era creating a business district that is still the core of the neighborhood today.

Mount Baker

Mt. Baker is one of two stops that have a school within walking distance of the station. Unlike Rainier Beach High School (located 0.5 miles from the Rainier Beach light-rail station), Garfield High School is located two blocks away from the Mt. Baker Station. Mt. Baker is one of three stations in the Link Light-Rail system that has an elevated track and station. The majority of housing located in the Mt. Baker neighborhood are single-family dwellings. Geographically it is the smallest neighborhood out of all the neighborhoods in the Rainier Valley. It's location on the major arterials Martin Luther King Jr. Way and Rainier Ave. make the station a hub for the community. With views of both the Olympic Mountains and Cascade Ranges, Mt. Baker is one of Seattle's more

scenic neighborhoods. The area was purchased for land in 1905 and sense then has grown along with the rest of the Rainier Valley, most notably known for the Mount Baker Community Club. The club became known as a place where community issues were discussed, and which encouraged a sense of activism in the community (History Link, 2016).

Beacon Hill (Picture Source: Sound Transit)

Located just east of downtown, Beacon Hill was named after the historic Boston neighborhood of the same name in 1889. The area is known for its views overlooking downtown and the Olympic Mountains, as well as the home of the Pacific Medical Center. (History Link, 2016). The Beacon Hill Light-Rail Station is one of the few underground stops on the Link-Light Rail. Beacon Hill is a neighborhood with primarily single-family homes. Multi-family homes, though available, aren't as common as many other neighborhoods in the Rainier Valley. Beacon Hill today is comprised of a majority Asian population, but is still very racially diverse as are many other neighborhoods in South Seattle.

Link Light-Rail Construction

The Link Light-Rail broke ground for construction in November of 2003 after years of being in the dark at Sound Transit. The Central Link Light-Rail is the result of a 1996 bond issue that included a sales tax increase across King, Pierce, and Snohomish Counties. The project was met with positivity and backlash. Backlash stemmed from opposition in the Rainier Valley over the Environmental Impact Statement (EIS), stating

that the light-rail had to run above ground on the surface. The original scale for the Central Link was 21 miles. This was shortened to the current 14-mile length, due to changes increasing costs and pushing the groundbreaking for the project back. Sound Transit was awarded a $500 million grant from the Federal Transit Administration in October 2003 (Sound Transit, 2003). Final redesigns of the budget were completed after the shortening of the line put finances on track, and ground was broken a month later. The Central Link took five years to complete and cost $2.1 billion to build. The Central Link opened in 2009 running from Seattle-Tacoma International Airport to Westlake Station. The line was recently expanded to the University of Washington (March 2016).

(Mount Baker Station construction, 2007 – Source: Oran Viriyincy)

(Opening of the Central Link Light-Rail at SeaTac Airport, 2009 – Source: NW Progressive)

Methodology

The methodology used in this report is quantitative due to the amount of data needed to understand correlations between the construction of the Central Link Light-Rail (LRT) and housing affordability. Data from the U.S. Census and Social Explorer make up the majority of the data being presented. The information is presented in both graphs and maps in order to interpret different data sets clearer. Social Explorer and the U.S. Census

contain different forms of data. Social Explorer contains information that the Census doesn't have and vice versa. Ridership data from Sound Transit also presented in a graph is also used to illustrate the growth in popularity and accessibility of the light-rail and potential future projections.

South Seattle Census Tracts and Neighborhoods – 2014

Census Tracts	Neighborhoods
94	Beacon Hill
95	Mount Baker
100.01	Beacon Hill
100.02	Beacon Hill
101	Mount Baker
102	Columbia City
103	Columbia City
104.01	Beacon Hill
104.02	Beacon Hill
110.01	Dunlap
110.02	Beacon Hill
111.01	Dunlap
111.02	Dunlap
117	Rainier Beach
118	Rainier Beach

The data in this project can be understood through a comparative analysis. Past figures before the light-rail was built using data from the 2000 U.S. Census was compared to

data from Social Explorer and the American Community Survey in 2014. This data shows how the studied neighborhoods have changed over time. Multiple data sets have been pulled from these sources. This data include information related to household income (median), rent, and race and age demographics. Data relating to money and cost are best represented in graphs. Taking a quantitative approach when comparing a number of a geographic areas is better for conveying and understanding the changes in the neighborhoods over time, and was less time consuming than a qualitative approach. Combining the findings from the compared graphs and maps along with information from newspaper articles and peer reviewed journals from similar studies done in other cities will provide an answer as to whether the construction of LRT infrastructure does have an effect on housing affordability.

In addition to data collection and conducting a comparative analysis, an on-site visit to these specific neighborhoods was important for being able to link written data with a physical location. A walking analysis of the five neighborhoods was conducted in June of 2015. The walking analysis consisted of identifying the different types of housing in the communities and determining whether it was low-income or market rate housing. In addition to this, identifying the amount of each type of housing was equally important. The overall built environment of the Rainier Valley neighborhoods is of major importance. Looking at aspects such as pedestrian friendly infrastructure, proximity of light-rail stops to local housing, and local light-rail surroundings such as commercial development are important for determining how the built environment has changed over time.

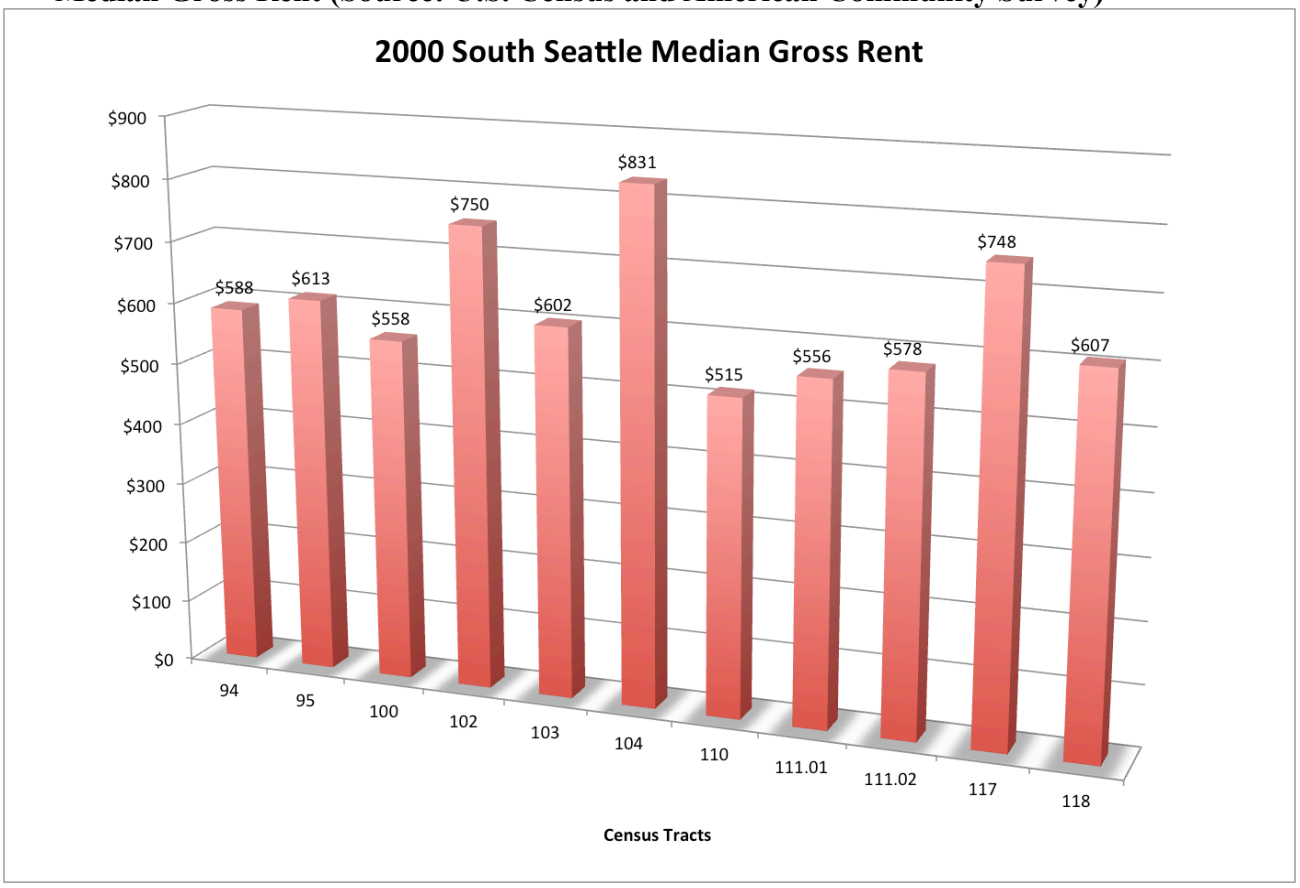
The specific census tracts shown in the map data were chosen with regards to the impact of the area surrounding the certain light-rail stations. Light-rail stations serve generally

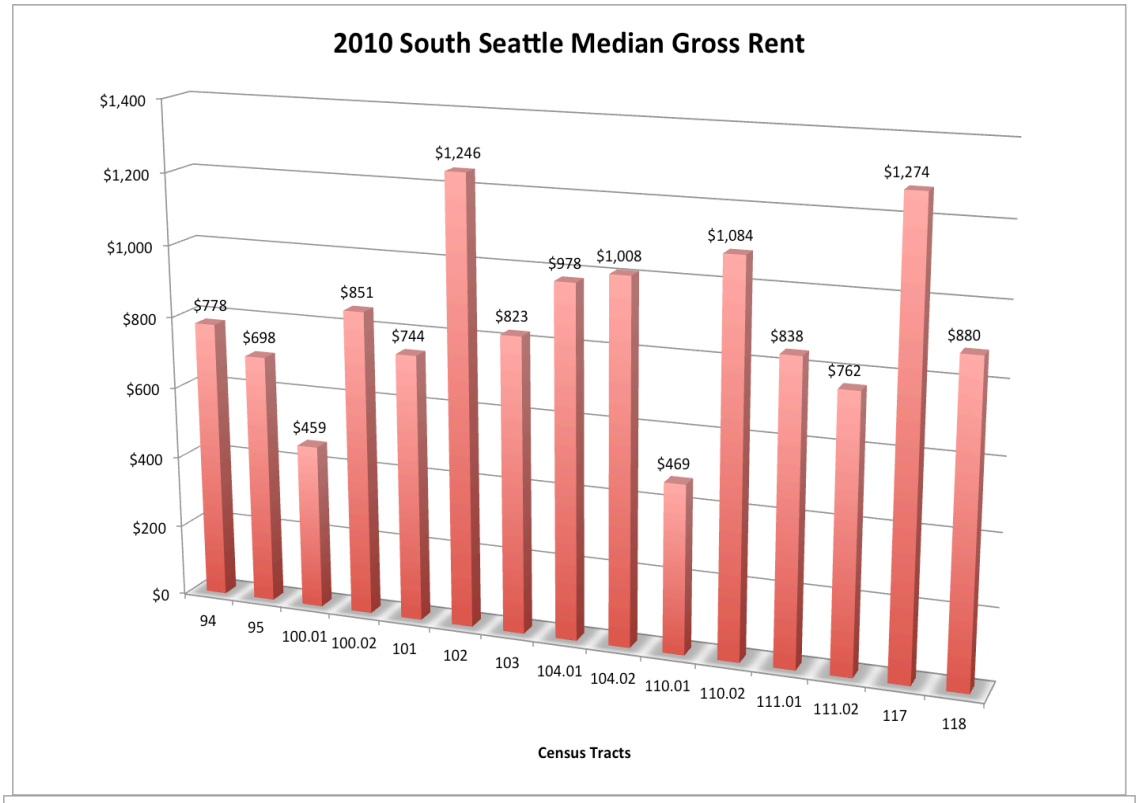
the neighborhoods that they are located in addition to the ones that are within walking distance. Many of the light-rail stations in South Seattle do not include park-and-rides, which is evidence that most people that take the light-rail in these communities live in these communities. Taking data from these certain census tracts as well as the ones neighboring them creates a better sense of understanding on how the light-rail has effect both the neighborhoods that they are in, but the ones in close proximity to it.

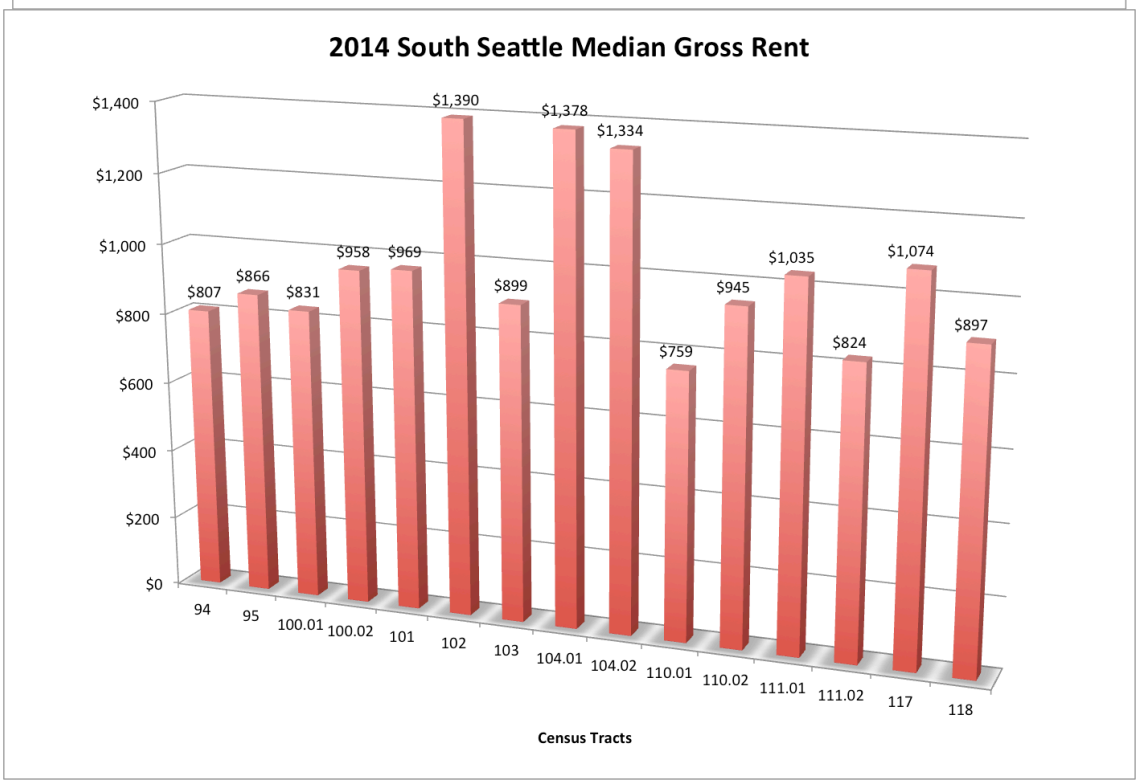
Data

Note: In 2010, census tracts 100, 104, and 110 from the 2000 census were all divided in half and eventually became tracts 100.01, 100.02, 104.01, 104.02, 110.01, and 110.02. Added to the bottom of each summary will be a figure that lists the 2014 average of these six census tracts in relation to their original tract in 2000.

Median Gross Rent (Source: U.S. Census and American Community Survey)

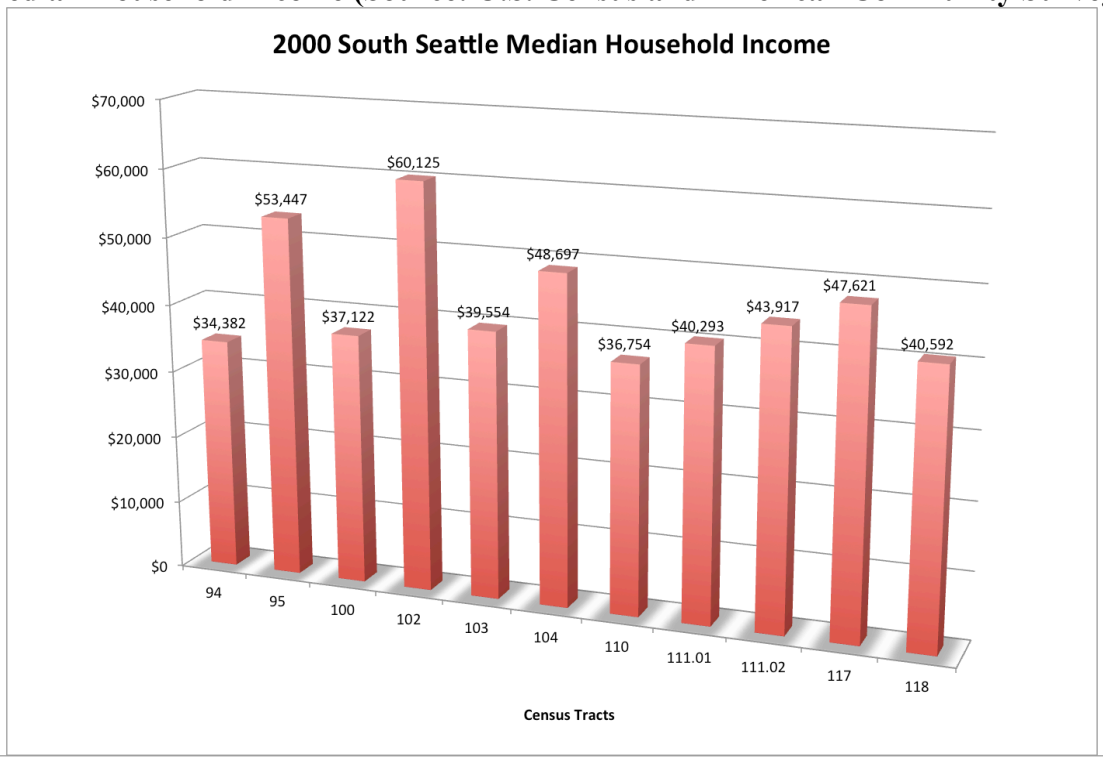


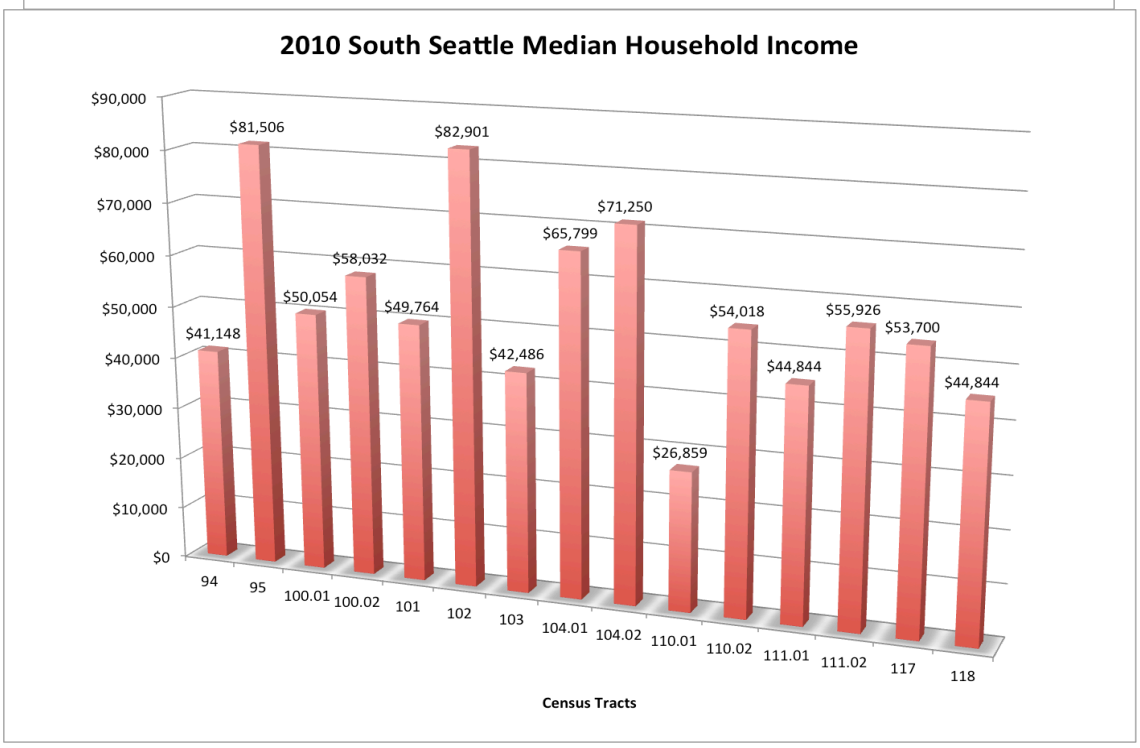


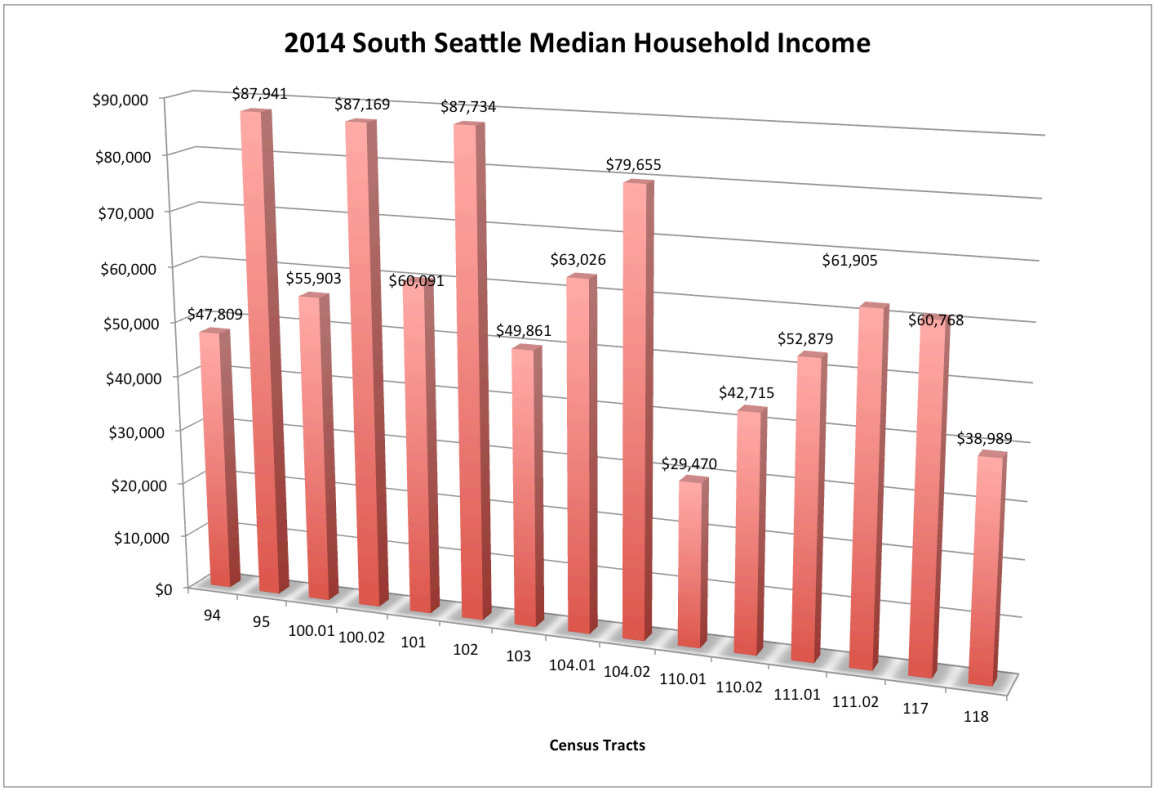


The average for tract 100 (100.01 and 100.02) was $894.50, tract 104 (104.01 and 104.02) $1356, and 110 (110.01 and 110.02) $852. (The median gross rent had increases that were constant in all years from 2000 to 2014. The largest increases were in tract 104, which eventually split and became tracts 104.01 and 104.02 in 2010, respectively.

Median Household Income (Source: U.S. Census and American Community Survey)

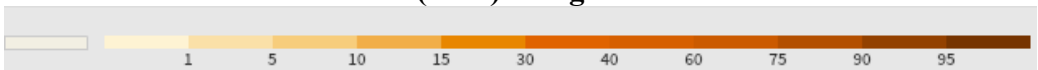


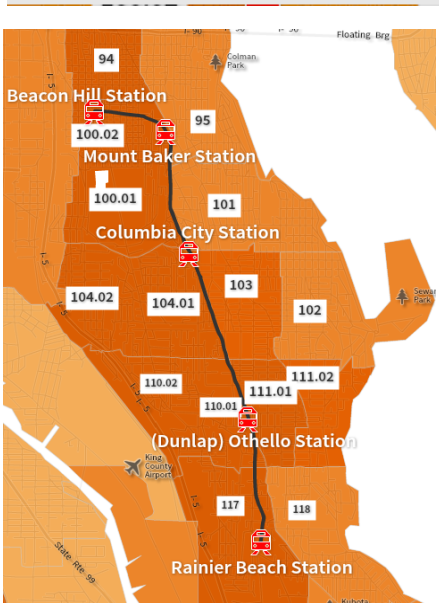




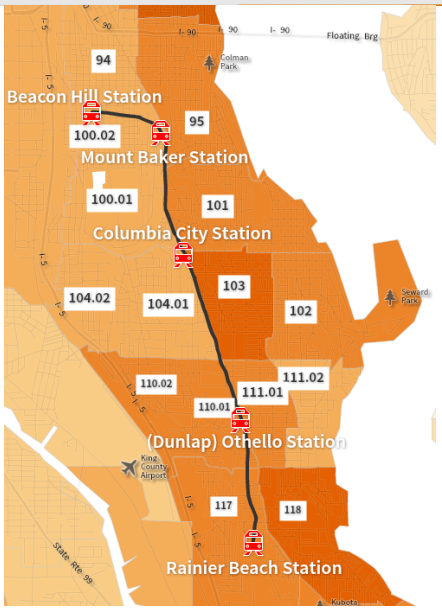
In 2010 the average for tract 100 (100.01 and 100.02) was $71,546, tract 104 (104.01 and 104.02) $71,340.50, and 110 (110.01 and 110.02) $36,092.50. The median household income over the course of 14 years increased in all census tracts. The most notable increases came in the time between 2010 and 2014. Of all tracts, the one with the biggest increase was in tract 100.02. This could have been partly due to the dividing of tract 100 into tracts 100.01 and 100.02

Race (2000) – Legend = %

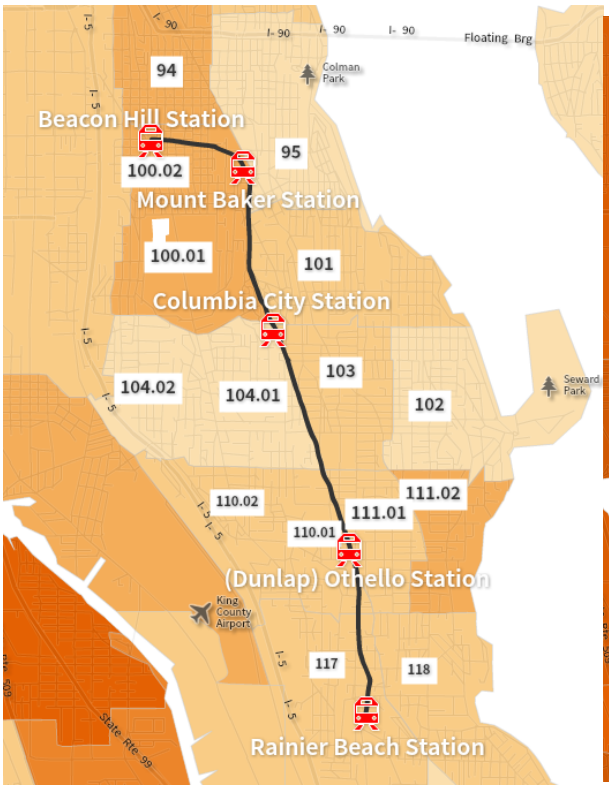




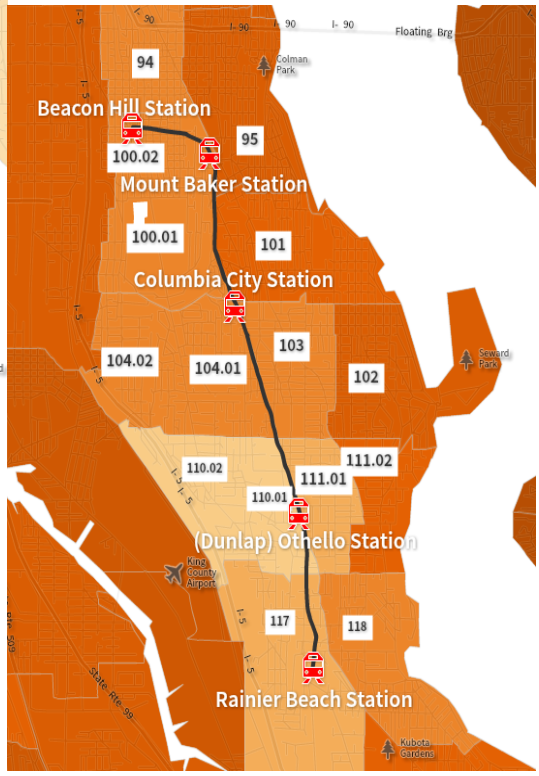
Asian



Black

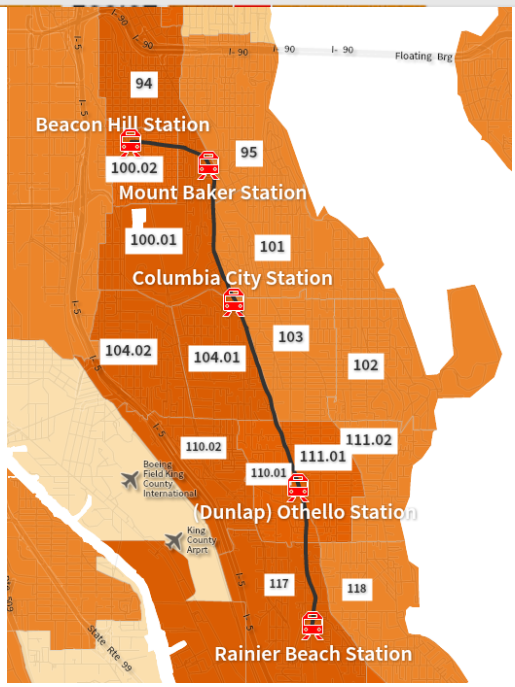


Hispanic

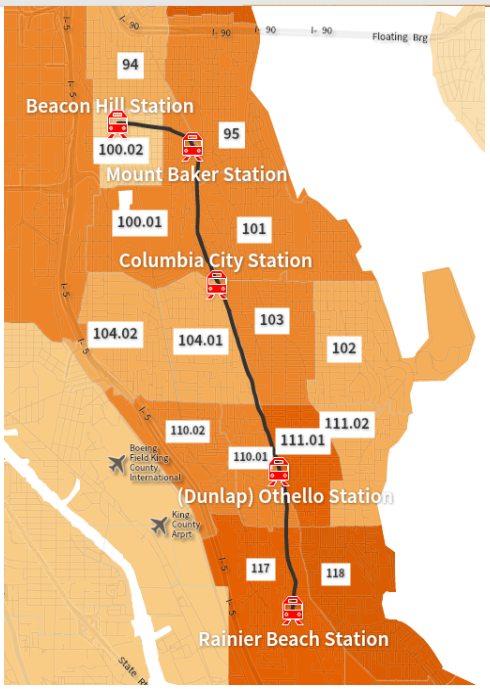


White

Race (2010) – Legend = %:



Asian



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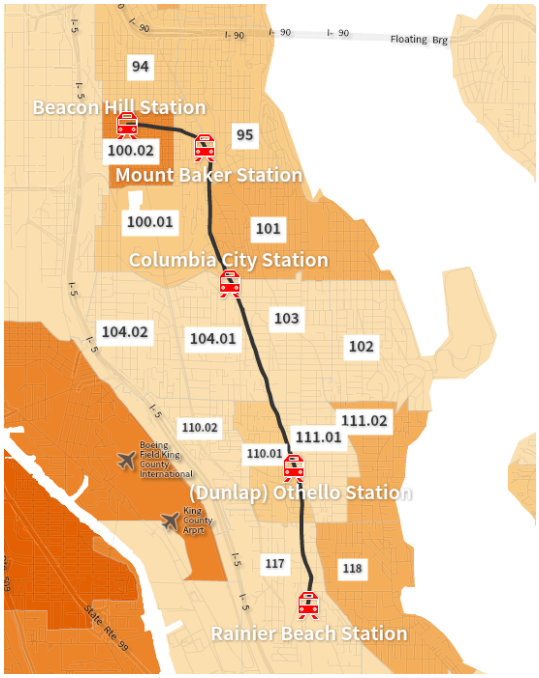
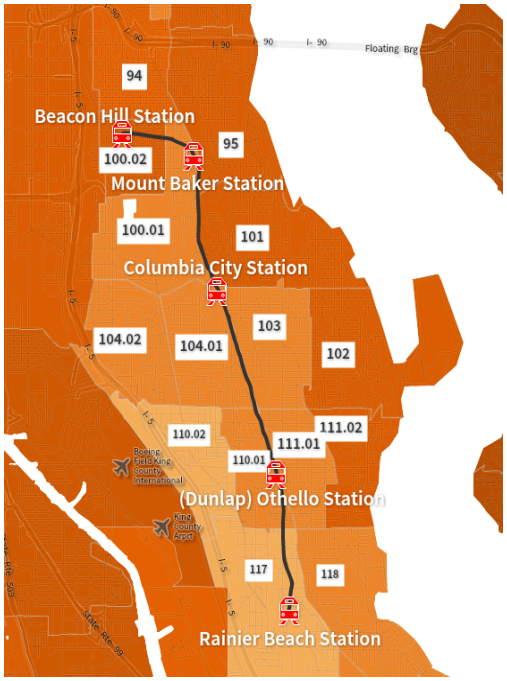
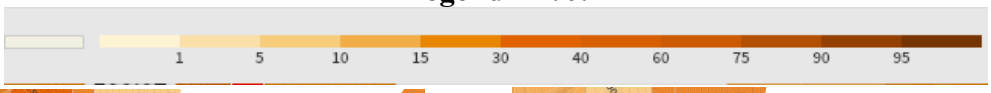


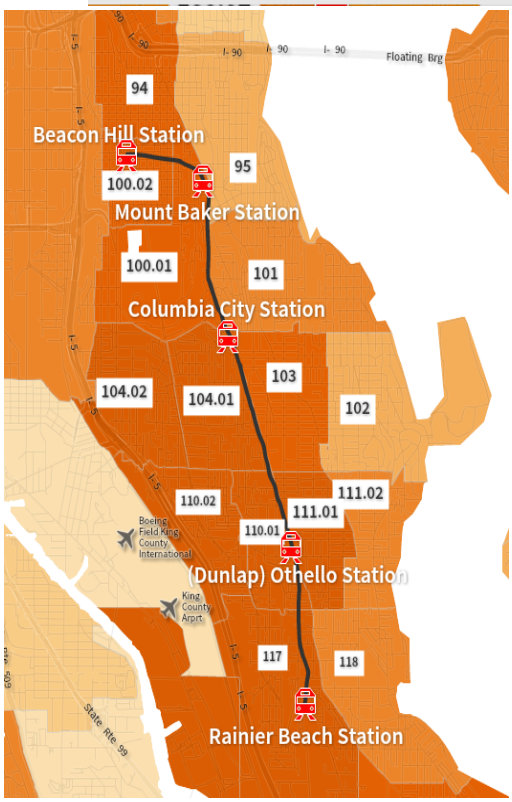
Hispanic



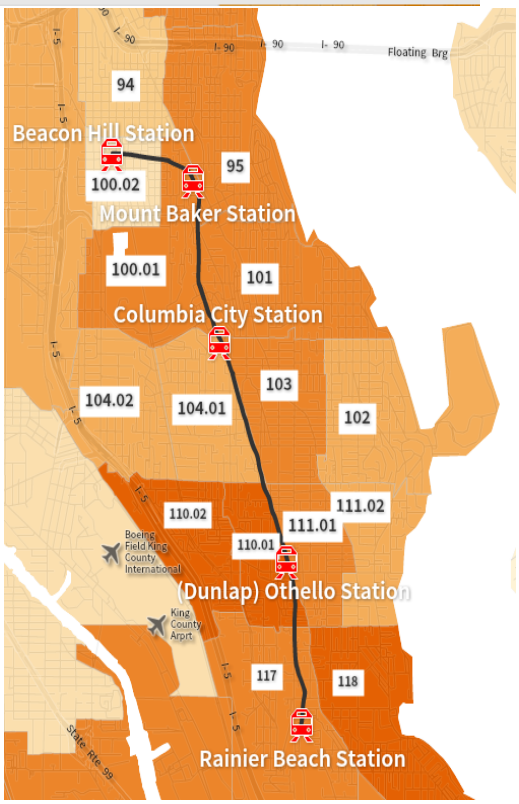
White

Race (2014)
Legend = %:





Asian



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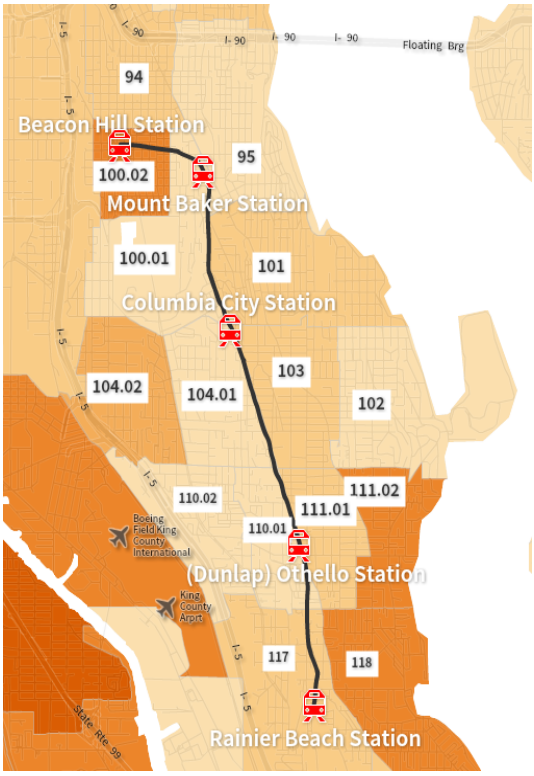
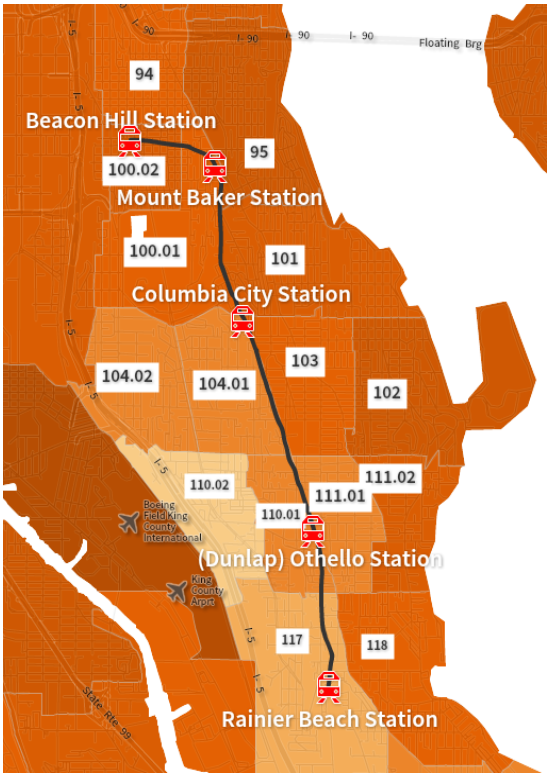


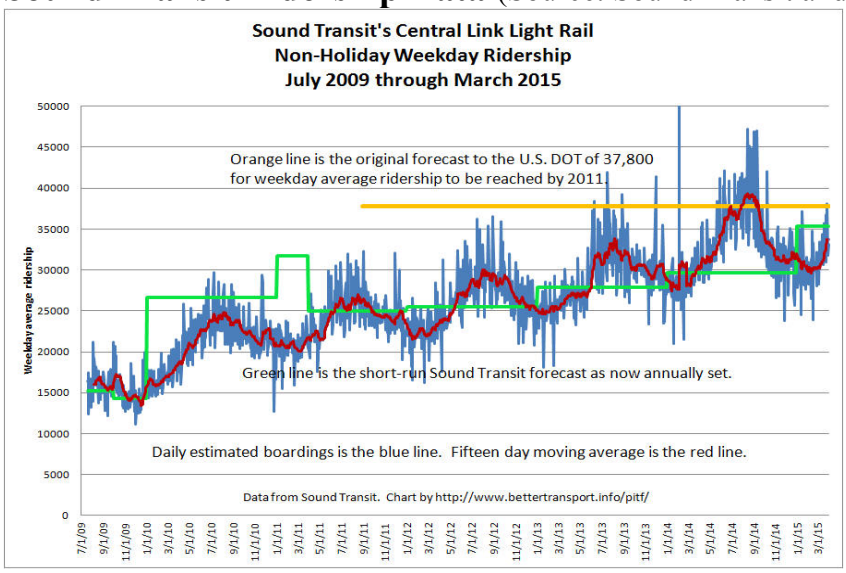
Hispanic



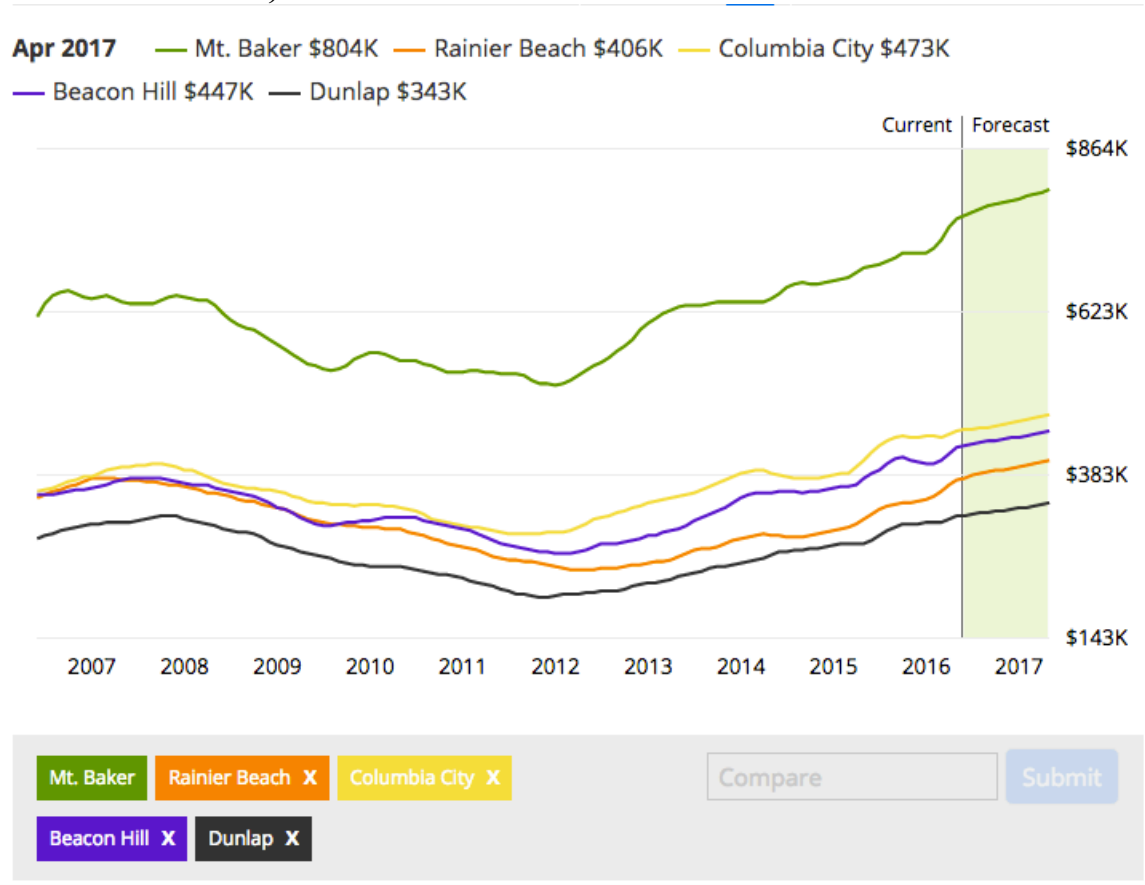
White

The rate of Hispanics in census tracts 100 (eventually tract 100.01 and 100.02) increased the most as well as in tract 118, 111.01, and 111.02 (a dividend of tract 111). Tracts 100.02, 111.02, and 118 currently have the highest concentration of Hispanics in the area. The white population saw little to no change. The black population saw its biggest growth in the southern portion of the Rainier Valley (tracts 117 and 118). Most of this growth came in tract 117. The black population did see a slight decrease across all other tracts. Next to the white population the Asian population is the second largest racial demographic in South Seattle. The growth of the Asian population has been steady since 2000 and continues to grow.

Sound Transit Ridership Data (Source: Sound Transit and Bettertransport.info)



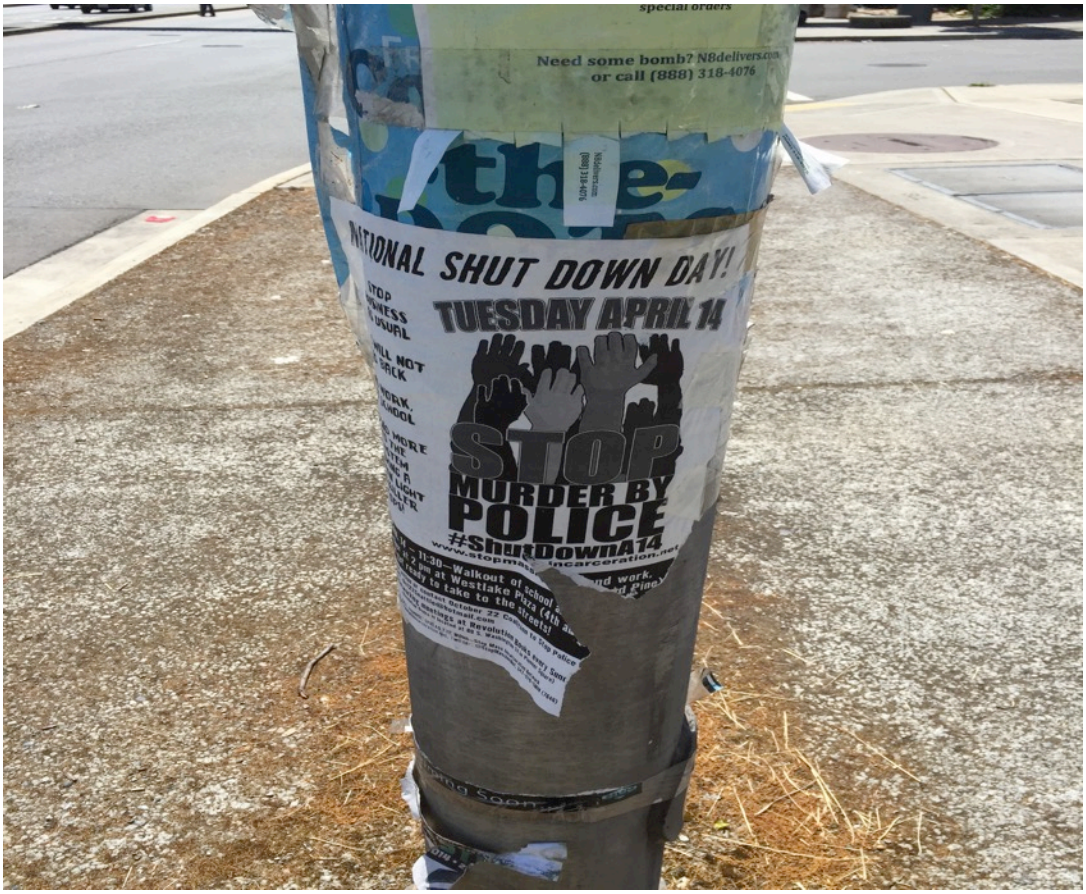
Median Home Cost (All neighborhoods, 2007 - Present) – Source: Zillow, 2016



Neighborhood Walking Analysis Photos

Beacon Hill (Beacon Hill Station)

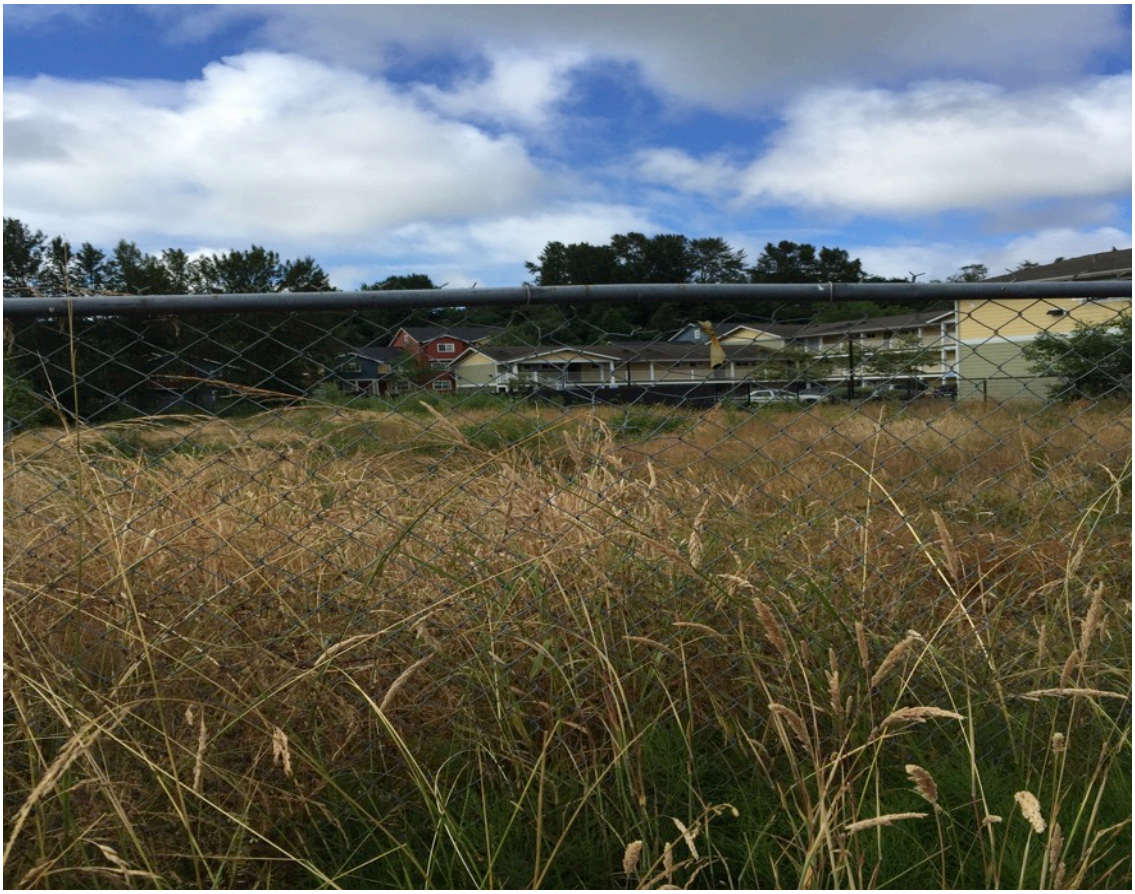
Mount Baker (Mount Baker Station)



Columbia City (Columbia City Station)

Dunlap (Othello Station)

Rainier Beach (Rainier Beach Station)



Results/Explanation of Data

Over the course of the past fourteen years (2000-2014), the Rainier Valley of South Seattle has changed. Much of this change can be attributed to how Seattle, the state of Washington, and the Pacific Northwest have changed over the years. What is unique about the Rainier Valley is the fact that light-rail public transit has expanded into the community. As early as 2000 the racial demographics of these different census tracts have shifted course. Instead of majority white, the most dominant racial demographic is Asian. This can be seen primarily in the Beacon Hill, Columbia City, and Dunlap (Othello Station) neighborhood. The Hispanic population has seen a steady decline, with growth in some pockets of the Rainier Valley. The black population has seen some decline, but also a slight shift in where many blacks reside, primarily in the Rainier

Beach community. In Seattle, people of color make up 33.7% of the population, the majority of them residing in these five neighborhoods. Asians make up the largest racial minority demographic with 13.8%, while blacks are second at 7.9%, and Latino at 6.6% (City of Seattle, 2016).

More noticeable than the change in racial demographics is the increase in the median rent and median household income. The median household income for the city of Seattle was $67,100. As a whole the average household income for all fifteen-census tracts was $60,394, almost $6,000 more than the city. In 2014, the Seattle median gross rent was $1,179, compared to $998 in the studied census tracts (ACS, 2014). One of the more prominent questions this study asks is what is considered affordable in terms of being able to sustain enough to afford housing in Seattle? Seattle recently voted to gradually increase the minimum wage to $15 an hour. This increase, if given the standard for someone who works 40 hours a week and takes 30 percent of their monthly income and puts it towards rent, isn't enough to meet the standard for an apartment in any census tract in 2014. This is assuming the person is looking for a one bedroom or a studio apartment. This compared to 2010, when the minimum wage in Washington was $8.55 (Washington State Department of Labor, 2016); this meaning the average person working 40 hours a week at this wage and taking 30 percent of their paycheck towards rent would be closer to affording an apartment with that wage in 2 census tracts (100.01 and 110.01). In just four years (2010-2014) both the median gross rent and household income have increased eighteen percent and ten percent in these neighborhoods, compared to sixteen and seven percent for all of King County. These percentages aren't a big difference within the studied census tracts and county. In addition to this the median cost of a home

in Seattle has risen 15.4% since 2015; out of the five studied neighborhoods, the cost has risen only 13.14% during the same time frame.

These increases can be contributed to the overall growth of the city, but this data shows that it's possible that creation of the Central Link Light-Rail could have played a part in this increase, though doesn't show signs evidence of a direct impact. One sometimes overlooked factor is the city zoning and land usage. Seattle currently has 49 percent of its land use zoned to single-family housing and only eight percent zoned to multi-family housing. This in retrospect makes it more difficult to create more affordable housing (typically multi-family housing) due to its limited space and high percentage of already claimed land (City of Seattle, 2016).

Neighborhood Walking Analysis Results

Walking and analyzing the different neighborhoods proved to be a good way to understand the physical built environment of the area being studied. The built environment should be able to provide clues as to whether the housing in these communities is in the process of undergoing change. The communities of Beacon Hill provided a sense of single-family dwellings that were relatively affordable, but in low supply. There wasn't an abundance of multi-family housing, though there was evidence of higher costs multi-family housing under construction. In the other five neighborhoods the trend was very similar; plenty of single-family housing and multiple examples of higher cost multi-family housing. There was evidence that lower income housing was in dwindling supply, but still enough to sustain the community. This was most prominent in the Dunlap neighborhood. The majority of higher cost housing was located within one to three blocks of the light-rail stations, particularly in the Columbia City neighborhood.

Beacon Hill	Mount Baker	Columbia City	Othello	Rainier Beach
• Below ground station • Single-family housing • Multi-family housing • Majority Asian	• Elevated station • Single-family housing	• Newer multi-family housing • Pedestrian friendly infrastructure • Mixed-income • Street level station	• Commercial development • Multi-Family housing • Single-Family housing • Public/low-income housing • Street level station	• Multi-Family housing • Lower Income housing • Vacant lots • Bicycle Infrastructure • Street level station • Highest African American Population

Discussion and Conclusion

This paper examined the possibility of the Sound Transit Central Link Light-Rail opening effecting housing affordability in the South Seattle Rainier Valley area. The data presented in the results gathered from sources from the U.S. Census, American Community Survey, and Sound Transit shows that these neighborhoods have changed drastically since the 2000 census. The biggest increases have come after the 2010 census and into the American Community Survey in 2014 with regards to median gross income and median household income. The cost of living in these neighborhoods is the biggest indicator that housing affordability is becoming a major issue not only in these neighborhoods, but also in all of Seattle. Comparative to other neighborhoods and King County as a whole, these five neighborhoods have higher rates of increases in household income, gross rent, and racial demographics. Though they are higher, the rates of change aren't much different from the county rates of change. These neighborhoods differ by

only by a few percentage points are these neighborhoods different. This, combined with ridership that has been on the increase since the opening of the LRT line in 2009, and the neighborhood walking analysis that shows that the types of housing and built environment are going through slow stages of transformation, it is appropriate to say that it is too early to determine if the LRT line is a direct component in the change of housing affordability in South Seattle. More data, in depth study, and most importantly time is needed to confirm whether these changes are related to new transit in the area. This project was meant as a starting point for future studies on LRT transit effecting communities in Seattle. As time progresses it will be important to see how these neighborhoods as well as other neighborhoods effected by LRT transit in Seattle transform around the transit effecting their communities especially after the 10th anniversary of the opening of the Central Link LRT. With the line only being 7 years old, there is an insufficient and limited amount of data that can be used to prove the existence of transit affected housing affordability. Going forward, it will be important for Sound Transit to take into account how their future expansions affect the communities they are servicing, especially with the talks of the ST3 transportation bill in the works for future projects. Most likely, once the new census comes out in 2020 it's possible that sufficient data and time will be available to study whether the Central Link LRT line has contributed or is a direct cause to a possible rise in housing affordability.

Recommendations

It's important to consider the growth of an area when planning transit. A recommendation from this study is to encourage the city of Seattle to look into changing certain zoning jurisdictions into multi-family zoning, which creates the possibility of more affordable housing. Another recommendation is for Sound Transit to consider for its future LRT

lines is the proximity of them to units of affordable housing. Having LRT transit in close proximity to affordable housing gives residents of all incomes the availability to ride transit wherever they chose and should be of interest when deciding the design of routes for future extensions such as the future North Link to Lynwood and East Link to Bellevue. As the next census comes out in 2020, it is important that officials from the city of Seattle, Sound Transit, Puget Sound Regional Council (PSRC), and the Federal Transit Administration (FTA) identify the population changes as well at the value of lands after the tenth anniversary of the Central Link Light-Rail in order to identify if the LRT line in these neighborhoods that they serve is having a positive impact on the community for people of all incomes. Listening to the people's concerns in public meetings and forums will also be a critical part of understanding where the changes need to made from the multiple stakeholders involved with the Central Link LRT.

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